AQ-21042

Seat No. _____

Second Year B. Sc. (Sem. IV) (Non CBCS) Examination

March / April – 2016

P-401 - Physics : Paper - IV

Time : **3** Hours] [Total Marks : **75**

Instructions : (1) All questions are compulsory.
(2) Symbols have their usual meaning.
(3) Figures to the right side indicates marks.

1 (a) What is zone plate? Explain the theory of zone plate. **10**

(b) Explain: Difference between prism and grating spectra. **5**

OR

1 (a) Derive an expression for Einstein relationship. **10**

(b) Explain: Spontaneous emission. **5**

2 (a) Derive an expression for acceptance angle of the optical fiber. **10**

(b) Explain: Numerical aperture **5**

OR

2 (a) Explain the principle, construction and working of phase-shift Oscillator. **10**

(b) Explain: Term `Feedback'. **5**

3 (a) What is amplitude modulation, explain the transistor AM-modulator. **10**

(b) Explain: Frequency Modulation (FM). **5**

OR

3 (a) Describe the construction and working of a UJT. **10**

(b) Explain: The construction of JFET. **5**

4 (a) Explain, the Encoders and Decoders in detail. **10**

(b) Explain: AND-gate with necessary figure and truth table. **5**

OR

4 (a) Describe the construction, working and characteristics of the Solar cell. **10**

(b) Explain: the Photo transistor. **5**

5 Explain the following : (any **three**) **15**

(1) Time independent form of Schrodinger equation.

(2) Properties of wave function.

(3) Single and multimode fibers

(4) Amplitude Modulation (AM).

(5) NAND gate as a Universal gate.